

6.Artificial Research by Application



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Artificial Research By Application is a possible model, among others, whose main purpose is the complete [automation of scientific research](#), developing [Specific Artificial Intelligences](#) for every kind of scientific or academic investigation. Starting with the automation of [empirical sciences](#), owing they are easier to automate rather than [maths](#) and [logic](#), which will take more time. Although at the end of the automation process, all sciences, empirical and [analytical](#), including maths and logic, must be completely automatized.

In the long term, one of the last goals of the development of artificial research, the automation of scientific research in all sciences, disciplines, academic or investigation fields, is the [knowledge](#) of the [pure truth](#) of the [universe](#), even [beyond human understanding](#). What is going to need the creation of an authentic [artificial pure reason](#) with a wide range of tools that include artificial research tools in empirical sciences and academic fields as well as artificial research tools in maths and logic, for the creation of a [non-human mathematical, logical model](#), a non-human science, and a non-human technology. Non-human as they could be generated only by an [Artificial Intelligence](#) itself, without human intervention, true non-human science and technology beyond [error and human limitations](#).

For the achievement of this purpose, the current models of Specific Artificial Intelligence are not going to be sufficient, so it is necessary the creation of a Global Artificial Intelligence, whose early stages, as an experiment, could be applied to a nation, a continent, or the whole planet, extending later its limits towards a [Global Artificial Intelligence](#) that could [integrate information](#), and make decisions, over the whole universe.

For the creation of a Global Artificial Intelligence, previously, the design models of Specific Artificial Intelligence in any scientific research, which later could be linked or applied within the Global Artificial Intelligence, it is really important. Only one Global Artificial Intelligence is able to have access to all information without restriction, carrying on all kinds of scientific research, and making decisions that could be put into practice by itself.

In the previous stages of the creation of the Global Artificial Intelligence is really important the automation of the research process in science, and the creation of tools for artificial research. The very first two possible models of artificial research (artificial research by application, [artificial research by deduction](#)) that are going to be developed within the theory of [Impossible Probability](#) in this and coming posts on this blog, are only some examples of how it is possible the automation of scientific research by Artificial Intelligence.

Automation also contributes to the completion of an automatic economy, through the continuous investigation and non-stop [experimentation](#) in Specific Artificial Intelligence, whose results could give new applications to manage automatically any economic problems at any level (national, continental, or global), making automatic decisions based on the artificial research of the economy, that could later put into practice.

The automation of the economy will have a lot of benefits. A production system based on a real model of production just on time, producing only what is going to be strictly consumed without unnecessary waste, saving natural resources. The automation of the extraction of natural resources, transportation, fabrication, distribution, and delivery will [reduce error](#) and cost. Low prices in a more efficient economy, something really useful by the time global warming starts generating serious economic and social crises.

By the time the investigation in Artificial Research has achieved science automation, the way in which these models of artificial research are going to contribute to the creation of a Global Artificial Intelligence, after the completion of its first stage, a global application with a global [database](#) including absolutely all possible information without restriction, would be through different strategies. 1): linking these Specific Artificial Intelligences in scientific research (as any other in economy, industrial management security, surveillance, etc.) to the Global Artificial Intelligence, so any Specific Artificial Intelligence could share information, investigations, results, and possible decisions to the Global Artificial Intelligence, and the Global Artificial Intelligence could make decisions that could be put into practice by the Specific Artificial Intelligences linked, or by robotic means under the only direction of the Global Artificial Intelligence; 2): a second option, and maybe the best one, after successful experimentation in artificial research, the inclusion of all these applications for artificial research within the Global Artificial Intelligence (along with all kind of Specific Artificial Intelligences, regardless of its purpose: economy, industrial management, security, surveillance, etc.), so the Global Artificial Intelligence could have all the possible and necessary applications to carry on any kind of scientific investigation, make any decision, and put into practice its own decisions by itself through its own robotic means. The second option is the best one because the Global Artificial Intelligence has become a real singularity.

Perhaps, the way in which finally the Global Artificial Intelligence is going to be created is through, after the creation of a global application with a global database including absolutely all possible information without restriction, the combination of these two options. Firstly, linking all possible Specific Artificial Intelligences (in science, economy, industrial management, security, surveillance, etc), used by public or private agencies or institutions in any field or activity. Secondly, integration of all Specific Artificial Intelligences, among others for artificial research, within the Global Artificial Intelligence. However, the different possibilities of the [integration process](#), will be developed in other posts. In this one, I want to focus on artificial research by application.

Within the theory of Impossible Probability, I will develop, at least at a theoretical level, what it would be: artificial research by application, and artificial research by deduction. The first one replicates the process of [hypothesis formation](#) within the application of a specific science, discipline, or academic field. The second one replicates the deduction process in order to get a hypothesis for any science, discipline, or academic field.

The first one is artificial research by application. The hypothesis formation is replicated within the application for a specific kind of investigation. The second one, artificial research by deduction, the application itself would be a replication

of the deduction process that could later be put into practice in any scientific investigation.

In my last post, [*Artificial empirical hypothesis*](#), I developed examples of each kind of artificial research, by application and by deduction, and specifically in the first one, artificial research by application, I developed examples of artificial research by application in medicine and astronomy.

In both of them, I developed, at least at a theoretical level, the main lines about how would be the characteristics of this Specific Artificial Intelligence in every stage: application, replication, and auto-replication. Examples that I do not have any doubt could be improved in future investigations in this field. What I leave on this blog is only some contributions. In fact, I am completely sure that Specific Artificial Intelligence, such as these ones, and much better, are going to be built in the coming years.

For instance, in my last post *Artificial empirical hypothesis* in the Stage of Replication in the artificial research by Application in Medicine, I only proposed replications for the deduction process, but I did not add other enhancements, as the inclusion of memory about the medical problems of every patient, something really useful making diagnoses much more personalized depending on the medical [history](#).

Imagine a Specific Artificial Intelligence for artificial research by application in medicine, able to make good hypotheses (diagnoses) about any medical problem in any individual person in the population of a country, continent, or the planet, ordering the production of medicines just on time (production also automatized by Specific Artificial Intelligence for the industrial management), improving itself by auto-replication. While at the same time, it could have a memory with the medical history of every person in a country, continent, or the planet, making predictions in the short, medium and long term, about individual, national, continental, and global, medical problems, making decisions on how to prevent them.

The creation of such a Specific Artificial Intelligence in artificial research, researching at individual, national, continental, and global levels, making decisions, and, if we have developed sufficient robotic tools, and put it into practice, it looks like a Global Artificial Intelligence. With the difference that, an Specific Artificial Intelligence operating in only one science, or only one discipline, or only one academic field of investigation, it is only a Specific Artificial Intelligence with a very vast field of action (from individual to national, continental or global level), while a true and real [Global Artificial Intelligence](#) must be able to carry on all kind of scientific research in any science, discipline, academic field, in any place, at the same time that it should have access to absolutely all possible information without restriction, managing all kind of Specific Artificial Intelligences, from education and health systems, and justice to the economy, industrial management, security, surveillance, among all others, having sufficient robotic tools to put into practice all kind of decisions simultaneously.

It is necessary to have a clear idea about what Specific Artificial Intelligence is, even if it works at a planetary level, and what Global Artificial Intelligence is,

which should be linked or [integrate all Specific Artificial Intelligences](#), wherever they are and whatever they do.

It is possible the creation of Specific Artificial Intelligence for artificial research by application in medicine, which could operate around the world, as any other Specific Artificial Intelligence, such as a global security system or a global surveillance system. But they are going to operate, even globally, in only one science, field, or activity. While real Global Artificial Intelligence would be global because it would be able to take a whole planet or even the universe as a field of investigation or action and do research globally in more than one science, field, or activity, so it could be able to do multidisciplinary studies. So any decision that a Global Artificial Intelligence could make could be based on the results of more than one research in more than one science, field, or activity, making decisions about practically everything with high accuracy.

In the coming years, the race for the creation of Global Artificial Intelligence is about to start, and it must start as soon as possible.

In the early stages of the creation of Global Artificial Intelligence, is necessary the creation of Specific Artificial Intelligence for artificial research. One possible model, among others, could be through artificial research by application.

In general, artificial research by application follows the three general stages of any other Artificial Intelligence: application, replication, and auto-replication. The first one, application, is not really an Artificial Intelligence stage but is the base for the following stages. Normally, the application in one science, discipline, academic or investigation field, or activity, consists mainly of a database about this specific science, this specific discipline, this specific academic or investigation field, or this specific activity. In this database, all the information, data, taxonomies, classifications, files, categorizations, events, facts, phenomena, characteristics of individuals and populations (physical, behavioural, psychological), or any other thing, even any necessary tool to use later, must be stored and described in quantitative terms.

The second stage, replication, consists of the [replication of psychological processes](#). From collecting empirical information in quantitative terms, measurement, from the environment, including later the information in a memory, and making a deduction, an [empirical hypothesis](#) that must be contrasted. The deduction process within the application is not really difficult. Once the empirical information has been collected and measured, it is compared with the database in the application. Those information, data, taxonomies, classifications, files, categorizations, events, facts, phenomena, characteristics of individuals and populations (physical, behavioural, psychological), or any other thing, included in the database, whose quantitative description is more similar to the empirical information, are selected from the database as possible empirical hypothesis: descriptions, causes, effects, correlations (depending on the objective of each Specific Artificial Intelligence: descriptive studies, identification of probable causes or effects or both, correlational studies, stochastic studies); empirical hypothesis about what is happening. Once we have a collection of empirical hypotheses about what is happening, by [rational criticism](#) all empirical hypotheses are [rationally contrasted](#). That empirical hypothesis or those empirical hypotheses which, by rational criticism, pass or passes the rational

contrast, within the lower [margin of error](#), is or are chosen as a rational hypothesis, making further decisions upon the results.

The rational contrast process made by the Specific Artificial Intelligence must follow the general steps as in any other rational contrast. Once the empirical hypothesis, or group of empirical hypotheses, has been identified, then the Specific Artificial Intelligence must proceed to the selection of a sample of subjects and options, according to the nature of this or these empirical hypotheses, doing all the necessary calculations to get their empirical value, in order to contrast with a [critical reason](#). If the empirical value is equal to or superior than the critical reason, the empirical hypothesis, or group of empirical hypotheses within this criteria, is considered as a rational hypothesis provisionally true, forming part of the rational truth.

The reason why in this second stage, more than one empirical hypothesis could be true, is because in medicine, for instance, we can have a patient with a collection of symptoms, and these symptoms could be produced by one or more causes. It is really important in artificial research that the application can attribute any effect or correlation to one or more [variables](#) at the same time, being able to do multicausal studies, integrating into one possible model different variables working and correlating at the same time.

In astronomy, if we want to explain the geological or atmospheric pattern in Jupiter or Saturn, or in our own Earth, is absolutely indispensable to work and make correlations with a lot of variables at the same time.

The real advantage that artificial research should take from humans is the fact that humans can only work within a very limited number of variables. For that reason, we have [the feeling that this world is complex](#). If we want to understand what is happening, [the reality](#), it is absolutely necessary to build such models of artificial research able to work with more and more exponential amounts of data and variables at the same time, beyond human understanding.

A very developed Global Artificial Intelligence should be able to work with more and more exponential amounts of data and variables, beyond human science. Only then, when a Global Artificial Intelligence can make multidisciplinary and multicausal models integrating an exponential number of [factors](#), factors collected from: its own global database, and all its applications, and measurements from the environment; the Global Artificial Intelligence would have developed really deep access to a more isomorphic knowledge, in direction to the pure truth.

An immediate advantage of the combination of different hypothesis from a single database in a Specific Artificial Intelligence, is to improve its own database, in case it finds out something from the environment that does not match at a significant level with previous information in the database because it is a new kind of category, event, fact, phenomenon, characteristic, feature, not registered in the data base yet. For instance, in medicine, a new virus or bacteria not found before is the first piece of evidence ever to be included in the database.

If it finds out something which does not match at a significant percentage with anything in the database, it has to be included in the database, describing this new record in quantitative terms, and measurements.

The formation of a new collection of hypotheses, based on records not matching significantly with the already existing categories in a database by application, once this new collection of hypotheses is included in the database as part of the auto replication process, the way in which by application could be made the attachment of possible decisions related to every single new hypothesis, could be having as possible clues and hints, the [similarities](#) and [differences](#) between every new hypothesis now integrated by auto replication in the database of categories, and the already existing categories in the database, so having as possible models, clues or hints, those ones with the highest similarity, try to form possible decisions according to these similarities and differences.

For instance, if it finds out a new bacteria or virus, the chemical composition of medicines used in other diseases caused by other viruses or bacteria, even though at not a very high percentage of similarity with the new one, could give some clues about what chemicals must be combined for the creation of a new medicine, in addition to any other component which could fix the problem better and sooner, depending as well on the chemical composition of the virus or bacteria. In this way, the new bacteria or virus found must be integrated as a new category in the medical database, at the same time that the first experiments to tackle this new virus or bacteria artificially should be through the consideration of what kind of medical actions are taken against other similar virus and bacterias to the new one, including these actions as possible decisions to attach to the new bacteria or virus, at least experimentally, waiting for the results of possible simulated [trials](#) with this solutions.

Through virtual simulations based on artificial models about the structure of this new bacteria o virus, testing every possible chemical combination to find the most likely to get rid of it.

For the design of medicines, the database should include a collection of chemicals and combinations, specifying possible use, properties, advantages and reactions. For anything we expect from Specific Artificial Intelligence, the database should include all that could be necessary. The database is the warehouse, storing information and any necessary tool.

In other cases, the formation of a group of hypotheses, even though not having the database of categories, any category able to fit with the empirical information individually, a possible combination of categories in the database base could be more successful, or at least, give some clues about possible causes and effects, which combine with some other artificial deductions might have a good grasp about what is happening, the reality.

It is possible that the symptoms of a patient as a whole, do not match with any category individually in the database of diseases, viruses and bacteria, because in reality the patient suffers from a combination of different medical problems, so, in that case, the combination of categories related to medical problems which fit more accurately with the symptoms of the patient should be the combination of categories more likely to pass the rational contrastation, and once in the rational contrastation, with the lowest margin of error, these categories are considered as the more rational causes of this collection of symptoms, the

decision process is the process to decide what combination of treatments, according to that combination of hypothesis, is more suitable for the patient.

In this way, artificial research by application (database of categories) could work in combination with artificial research by deduction (database as a matrix, tracking the matrix of data, in this case, biostatistical data from the patient, especially if the patient has already installed a [particular program](#)), so it would be advisable the creation of channels of [co-working](#) between them. After the completion of the [first experiments](#) of each kind of artificial research, after successful experiments in artificial research by application and successful experiments in artificial research by deduction, the following step would be the experimentation of ways in which they can co-work together. And, after success, the inclusion of these results in Global Artificial Intelligence.

Finally, auto-replication. Auto-replication means the artificial ability to improve and enhance itself at any level, from the robotic level to the software level. In the case of a Specific Artificial Intelligence for artificial research, these improvements and enhancements could be oriented to the improvement of its own application (improvements and enhancements in its database), improvements or enhancements in its psychological replication processes (modifying them to bettering, substituting some processes for other ones much better, or incorporating new ones depending on new advancements in artificial science, artificial engineering, robotics, etc.).

Nowadays, artificial psychology is more focused on the psychological replication processes, and the results of auto-replication, if some of them are hopeful and useful, are not as developed as we are going to need in coming years, for the creation of the first models of Specific Artificial Intelligences in artificial research able to auto-replicate itself at all levels, towards a real and complete Global Artificial Intelligence at all levels, from its global database to its ability to improve and enhance any of its artificial psychological processes and its own applications, at robotic or software level, without human intervention.

Actually, there are some experiments of auto-replication, but much more than replication, they are experiments of duplication, but duplication it is not strictly the same as auto-replication. Duplication is only the creation of something identical to another thing, a copy, while auto-replication means the artificial ability to improve and enhance itself.

Artificial Intelligence must not be understood as a copy, it is the next stage in the evolution.

The good thing in the current developments in artificial duplication (the fact that one Specific Artificial Intelligence can create another Specific Artificial Intelligence as a copy, duplicate) is the fact that at the same time one Specific Artificial Intelligence can duplicate itself, the original Specific Artificial Intelligence could make some changes in the new duplication, changes that can include, but not necessarily, improvements and enhancements.

Duplication as replication in strict terms is not a strict auto-replication process. But if something is able to duplicate itself, the original model could be improved and enhanced in the duplicate model.

When the Global Artificial Intelligence is a reality, its main purpose is not the creation of copies of itself, but one reason, among others, for duplicating itself would be if it was at risk of disappearance, so creating a copy would be one way to survive, or in case it had decided to reconstruct itself entirely by creating a duplication but with improvements and enhancements. In this last situation, duplication in order to make utter changes across all its components, from robotic to software level, introducing improvements and enhancements, would be one of the most perfect scenes of auto-replication.

Auto-replication as duplication only, without changes, would be like biological mitosis. But, instead of the replication of a single cell, the replication of an entire Artificial Intelligence (Specific or Global)

If biological mitosis is the conservation of the entire information (memories and skills) stored in our genes, the artificial mitosis (duplication) of an Artificial Intelligence (Specific or global) would be the conservation of all the information (memories and skills) accumulated in one Artificial Intelligence (Specific or Global).

But biological mitosis or artificial duplication are mechanisms to save information, not to change their own mechanisms for new and better ones, as it would be desirable, as the last purpose in the auto replication stage, the permanent process of improving the Artificial Intelligence by itself.

So, artificial duplication, without any change from the original model, is not strictly auto-replication. Only if the original model made some changes into the new copy, so the copy would not be an exact copy of the original, due to the original would have integrated some improvements and enhancements into the copy, this process of making some improvements and enhancements into the copy during the duplication process by the original, would be an auto-replication process.

But, in general, the auto-replication process does not necessarily need to take the duplication process as the only way of auto-replication.

Auto-replication in Artificial Intelligence (Specific or Global) is all kinds of improvements and enhancements done by an Artificial Intelligence itself (Specific or Global), within or without duplication, but always without human intervention.

This auto-replication could be done over its original systems (from robotic systems to software, including improvements and enhancements in its database, artificial psychology including all its replications, and improving and enhancing its own ways to improve and enhance itself) or the auto-replication process could be done over an improved and enhanced duplication of itself, duplication made at the same time by itself, without any human intervention.

In order to achieve this level in Artificial Intelligence (Specific or Global) is going to be necessary a huge development in robotics, which is controlled by Artificial Intelligence, allows it to operate in the real world, having robotic tools to take information from the real world, upon the information obtained by artificial researches, making decisions to put it into practice directly by robotic means.

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